



TITLE:

Studies on the Biological Assay of
Insecticides. (XI) : On the Discrepancy of
Knock Down Effect of DDT Powder Prepared
with Volclay Bentonite and Panther Creek
Bentonite to the Adult of Common Housefly
(*Musca domestica* L.)

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Although on the orientation of reaction products on the surface of single crystal has already been published, none has yet been reported on the case of metals which have fibre structure. We therefore studied on some compounds produced on the surface of copper and silver foils, prepared in the following way. Copper foils which are reduced to from 2.5 mm to $27\text{--}30\mu$ in thickness, have a fibre structure, whose axis $[111]$ is in parallel with the direction of rolling. Silver foils, reduced to from 1 mm to 30μ in thickness, have also a fibre structure, whose axis $[112]$ is in parallel with direction of rolling.

CuJ: To produce CuJ on copper foil, we put it on J_2 in test tube, to avoid the sublimation of J_2 , and heat at 70°C about one hour, and then we obtain CuJ film which peels off easily from ground copper foil. To this ground foil, Laue photograph is identical with that of the original foil; film shows continuous Debye ring (111) and suggests no special orientation.

CuCl: In putting the sample foil in test tube with PCl_5 , we can obtain yellow CuCl film, and Laue photograph of it shows incomplete and discontinuous rings, suggesting somewhat oriented structure, but not enough to determine the direction indices.

AgCl: As silver reacts with PCl_5 and Cl_2 very slowly, we dipped silver foil in mixed solution of NaCl and FeCl_3 . AgCl film thus obtained, showed the uniform Debye rings of (111) , (200) and (222) of AgCl, suggesting irregular orientation.

CuS: CuS is obtained as black film when heated with sulphur at 100°C 30 minutes. From the fact that this film is soluble in hot HNO_3 dil., but insoluble in H_2SO_4 dil., we can deduce that this may be CuS. As has been expected, Laue photograph shows continuous (100) Debye ring, suggesting no special orientation.

Cu_2S : By painting molten sulphur on copper foil, we can get rather black film. As this film is soluble in warm HNO_3 dil., we can expect this may be Cu_2S and its Laue photograph shows the Laue spots of planes (111) , (200) and $[112]$ axis of fibre structure.

17. Studies on the Biological Assay of Insecticides. (XI)

On the Discrepancy of Knock Down Effect of DDT Powder Prepared with Volclay Bentonite and Panther Creek Bentonite to the Adult of Common Housefly (*Musca domestica* L.)

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Volclay is known as "sodium bentonite" and Wyoming-South Dakota region is the largest place of production; Panther Creek is "calcium bentonite" and is pro-

duced mainly in Mississippi region. The former absorbs a large quantity of water, "swelling" enormously in the process, and remaining in suspension in thin water dispersion, and the latter absorbs only slightly more water than ordinary plastic clays fuller's earths, and being practically non-gel-forming and non-suspending in water.

These two bentonites when sprinkled as dusts (325 mesh), affect definitely lethal to adult of Azuki bean weevil, *Callosobruchus chinensis* L. The experiment were carried out under the constant temperature of 30°C and 100, 91, 73, 52 % relative humidities. The time-mortality data were summerized by the probit transformation method of Bliss. The median lethal time of these two bentonite dusts to Azuki bean weevil in all cases of sex difference and relative humidities throughout may be regarded as not heterogeneously with in the random sampling error.

And then 2, 4, 8 and 16 per cent of p,p'-DDT powder prepared with these two bentonite carriers dusted to adult of housefly (*Musca domestica* L.). The dusting chamber consists of a glass cylinder, 28 cm in inner diameter and 45 cm high, and two glass plates covering its upper and lower openings. From a round hole, 5 cm in diameter, of the lower plate of the chamber, 0.1 g of the powder was dusted up into the chamber containing houseflies under the pressure of approximately 1.5 kg /cm². The numbers of disable individuals were counted at the intervals in a geometrical time scale and the knock down percentages were calculated. Median knock down time of Volclay DDT powder which are similarly summerized by probit transformation method is shorter than it of Panther Creek DDT powder.

It can be said from the above mentioned facts that the biological assay is indispensable in inspection of insecticides as well as chemical analyses.

18. The Effects of Ultrasonic Wave upon the Fermentation Microorganism

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In the experiments, two types of ultrasonic wave generators with frequency of 560 Kilocycles per second (one of them has cooling system) were used.

A first, with yeasts (Rasse XII and American bakers' yeast) and *Bacillus subtilis* var. *ramie*, the conditions of the ultrasonic treatment upon the mortality of the organisms were investigated. In order to observe high mortality of the cells, malt extract and broth were used for yeart and bacterial suspensions respectively. The distance between the top of the crystal of the generator and the bottom of tube